

AIR FORCE PROGRAMS

Global Command & Control System - Air Force (GCCS-AF)

The Global Command and Control System – Air Force (GCCS-AF) consists primarily of the Theater Battle Management Control System (TBMCS), with additional functionality provided under the umbrella of the Air Operation Center Weapon System (AOC-WS) program. TBMCS provides hardware, software, and communications interfaces to support the preparation, modification, and dissemination of the force level Air Battle Plan (ABP). The ABP includes the Air Tasking Order and Airspace Coordination Order. TBMCS unit level operations and intelligence applications provide Air Force Wings the capability to receive the ABP, parse it, and manage wing operations and intelligence to support execution of the ABP.

TBMCS supports the development and sharing of a common relevant operational picture of theater air and surface activity. TBMCS common applications and interfaces provide a network for Joint Force data sharing. The TBMCS intelligence and targeting applications at the theater Joint Force Air Component Commander level and at the Air Support Operations Center (ASOC) and Direct Air Support Center supports the coordination of Precision Engagement fires, safe passage zones, and near real time warnings of impending air attack. The air and surface surveillance and weapons coordination engagement options enable synchronized operations and employment of the correct weapons for each target to generate the desired results. All TBMCS network participants have access to engagement intentions and results assessments, which contributes to improved decision-making by commanders.

TBMCS fielding includes every theater air component, all Navy aircraft carriers and command ships, all Marine Air Wings, and all Air Force flying wings and ASOC squadrons. Army Battlefield Coordination Detachments also interface with TBMCS.

The TBMCS has been in development since 1994. During 1999, TBMCS came under OSD oversight. The Program Management Office is the Air Force Electronic Systems Center at Hanscom Air Force Base, Massachusetts. The Air Force Operational Test and Evaluation Center (AFOTEC) became the lead test organization and has coordinated the planning and conduct of two TBMCS Version 1.0.1 Multi-Service Operational Test and Evaluations, as well as operational tests of Version 1.0.2 and 1.1. Version 1.1.1 was operationally tested late October 2002.

Since coming on oversight, the TBMCS program has made significant improvements and is compliant with the acquisition requirements for Major Automated Information Systems. There is an Operational Requirements Document (ORD) approved by the Joint Requirements Oversight Council and an approved Test and Evaluation Master Plan to accompany the new ORD. Coordination among the Services for defining Service-unique requirements is improving, and the Service Operational Test Agencies (OTAs) all work well together on this program.

The AOC-WS program is new and was without a funding line for FY02. Test activity has not been under DOT&E oversight, and has been primarily limited to small, but high priority improvements needed to support U.S. Central Command efforts in the Middle East. Both TBMCS and AOC-WS are being combined to form GCCS-AF, and testing processes involving Service OTAs may need adjustment.



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TEST & EVALUATION ACTIVITY

- TBMCS 1.1 (Force level) Combined Developmental Test (DT)/Operational Test, February 2002.
- TBMCS 1.1.1 (Force level) and AOC-WS 10.0.2 Combined DT/Operational Test, October 2002.
- TBMCS Unit-level Operations (UL-OPS) Spiral 5 Government in-plant testing, February 2002.
- TBMCS UL-OPS Spiral 6 Field Development Evaluation (FDE), September 2002.
- TBMCS Unit-level Intelligence (UL-Intel) Spiral 5 FDE, April 2002.
- TBMCS UL-Intel Spiral 6 FDE, December 2002.
- AOC-WS 10.0.1

TEST & EVALUATION ASSESSMENT

TBMCS 1.1 was assessed as effective and suitable, with significant improvements noted in suitability. There were significantly fewer problems for the users to work around, and this also greatly reduced the workload of the system administrators. Intermittent communications problems between the shore-based and ship-based systems caused a significant problem, but users still produced the Air Tasking Order on time. Training has been showing steady and significant improvement.

The TBMCS 1.1 test clearly showed that it is important to keep the number of cautions and warnings that users have to deal with to a minimum. Not only did users perform better, but it also greatly reduced the workload of the system administrators.

During the TBMCS 1.1 test, AFOTEC employed significant performance-monitoring systems to capture performance data. Licenses for these monitoring systems are expensive and are not delivered as part of the system. Therefore, to ensure operational realism, the system administrators were not allowed to benefit from this information during the test. These systems were able to show, in real time, performance problems that could have been fixed by system administrators, thereby improving overall system performance and especially response times seen by the users. Use of such performance monitoring systems is encouraged, especially in air operations centers performing critical real-world missions.

The spiral development philosophy used by the UL-Ops community is workable, but if consecutive releases are cancelled due to critical problems found during testing, then the user can wait a long time for desired functionality upgrades. For this reason, if this approach is taken, then about every third release needs to be developed with lower risk and higher probability of success during Operational Testing. The schedule for every third release would therefore need extra fix time added between DT and Operational Test events.

The lower risk spiral development philosophy used by the UL-Intel community is working well, they are entering Operational Test with mature systems, and they are fielding their releases on schedule. Eventually, the force-level and both unit-level systems will all be more closely integrated, so testing schedules in the future will be more difficult to coordinate.

TBMCS UL-OPS is using a fixed 6-month spiral development approach. If one spiral encounters significant problems, fix actions are made to the next spiral, rather than trying to slip the entire schedule and fix the spiral with problems. Early testing of Spiral 5 indicated the spiral should not be continued, the program office made the correct decisions, and fixes were planned for Spiral 6. Spiral 6 DT testing is showing a significantly more mature product and has been recommended for fielding.

TBMCS UL-Intel is using a 9-month spiral development approach in which time is programmed in the schedule for fixing problems found during early testing. During Spiral 5, this approach worked very well, and problems found during DT were fixed before the system entered FDE. As a result, the FDE went very smoothly, and the system was assessed to be effective and suitable.

Testing of AOC-WS 10.0.1 focused primarily on a special targeting toolkit, and this product was found to be acceptable for fielding. AOC-WS 10.0.2 was tested in conjunction with TBMCS 1.1.1 in October 2002. Preliminary indications are that the incorporated hardware and software changes will be operationally suitable, operationally effective, and interoperable.